

THE EFFECTS OF UNGRADED HOMEWORK ON STUDENT LEARNING AND HOMEWORK
COMPLETION RATES IN A HIGH SCHOOL BIOLOGY CLASSROOM

by

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of

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DEDICATION

I would like to dedicate this project to my incredible students! Thank you for participating in this action research project and giving honest feedback and thoughtful insights. Working with all of you makes teaching the best job in the world!

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I am grateful to my incredibly supportive husband, Joe Mello, and our wonderful kids! My mom and Joe have been available to discuss all things action research. Their thoughtful insights and suggestions have helped me navigate the challenges. The encouragement from my family helped me reach this exciting milestone.

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TABLE OF CONTENTS

1. INTRODUCTION AND BACKGROUND	1
School Demographics	1
Context of Study	1
Focus Question.....	3
2. CONCEPTUAL FRAMEWORK	4
The Great Homework Debate	4
Homework as a Tool for Learning	7
Sources of Methodologies.....	10
3. METHODOLOGY	12
Study Demographics	12
Treatment.....	13
Instruments	14
Instrument Analysis	15
4. DATA ANALYSIS.....	18
Results.....	18
Homework Completion Rates and Motivational Factors	18
Unit Assessment Scores.....	21
Formative Assessments and Student Achievement.....	23
5. CLAIM, EVIDENCE, AND REASONING	30
Claims From the Study	30
Claim One.....	30
Claim Two.....	31
Claim Three	33
Value of the Study and Consideration for Future Research	35
Impact of the Study on the Author	37
REFERENCES CITED.....	40
APPENDICES	44
APPENDIX A: Institutional Review Board Exemption	45
APPENDIX B: Sample Homework: Textbook Reading Guide	47
APPENDIX C: Anonymous Pre-Treatment Questionnaire	50

TABLE OF CONTENTS, CONTINUED

APPENDIX D: Teacher Treatment Journal.....	52
APPENDIX E: Treatment Homework Questionnaire.....	54
APPENDIX F: Non-Treatment Homework Questionnaire	56
APPENDIX G: Unit Assessment Questionnaire	58
APPENDIX H: Focus Group Interview Questions.....	60
APPENDIX I: Mean Unit Assessment Scores	62

LIST OF TABLES

Table	Page
1. Data Triangulation Matrix	17

LIST OF FIGURES

Figure	Page
1. Flow Chart of the Data Collection Process.....	14
2. Mean Percentage of Homework Completion	19
3. Homework Motivating Factors	21
4. Mean Unit Assessment Scores	22
5. Mean Percentage Formative Assessments Score with Graded and Ungraded Homework	24
6. Correlation Between Graded Homework and Test Scores.....	25
7. Correlation Between Ungraded Homework and Test Scores	26
8. Correlation Between Graded Homework and Confidence on Assessments.....	27
9. Correlation Between Ungraded Homework and Confidence on Assessments	28

ABSTRACT

In two high school Biology classes, a modified homework grading practice was implemented by removing the grade or credit from assigned homework. Homework provides students with opportunities to learn outside of the classroom and deepen their understanding of a subject. Homework doesn't account for the diversity of student life circumstances, rewards compliance, and does not necessarily measure what a student knows. This could be creating an unequal educational environment for student learning opportunities and evaluation of their learning. The purpose of this study was to determine how removing the grade from assigned homework affected student learning and homework completion rates. The study was implemented for 15 weeks and included four units of study. Prior to the study period, students were given an anonymous pre-treatment questionnaire. Throughout the study period, students completed daily formative assessments, daily homework questionnaires, summative assessments, and summative assessment questionnaires. Student focus group interviews and questionnaires were administered at the conclusion of the study period to obtain student opinions regarding their experience with ungraded homework. While the rate of homework completion decreased during the treatment units, there was not an overall significant difference between unit test scores during the units with graded and ungraded homework. There was a weak positive correlation between homework completion rates and student unit test scores. Homework is one of many tools that can support student learning. This study finds that when homework provides an opportunity to review and practice concepts already introduced in class, credit for homework may not be warranted. The data suggests that students who complete ungraded homework do so with more fidelity. Students can still achieve content mastery with homework that does not count toward or against their grade. However, homework completion was also shown to improve student learning. Awarding points incentivized homework completion.

CHAPTER ONE

INTRODUCTION AND BACKGROUND

School Demographics

I teach Biology at a small public high school in coastal California. During the 2022-2023 school year, 15.18% of our student population qualified for free or reduced lunch. According to school records, the racial identity of the student population is as follows: 2.7% African American, 1.4% American Indian, 8.1% Asian, 3.3% Filipino, 22% Hispanic/Latino, 0.9% Pacific Islander, 59.5% white, and 1% of students indicated two or more ethnicities.

At our school, all freshmen are required to take a science course. Students are required to enroll in Biology in either their freshman or sophomore year. The majority of our students complete Biology as freshmen and then continue on to either Earth Science, Physics, or Chemistry.

Context of Study

The homework completion rate in my Biology classes is high. Prior to the study period, over 92% of homework assignments were turned in. This is higher than in other years I have taught Biology. As a school site, we are currently reviewing our grading practices to see how we can ensure our grading is fair and equitable. One component of equitable grading is evaluating our homework practices. Many students have expressed that they feel overwhelmed with homework and their extracurriculars. If teachers are going to require students to spend time outside of school on homework, the rationale should be sound.

While the homework completion rate is high, it does not always seem to reflect student understanding and mastery of the Biology concepts. In my Biology courses, students receive a completion grade for turning in their homework. While I briefly check for general understanding, I do not grade for accuracy. We review the homework assignment as a class. This affords students the opportunity to correct their work and to clarify any points of confusion. It also gives me the chance to address any misconceptions during the homework review or throughout the lesson that day.

My perception is that many students are rushing through the assigned homework, and some may be copying a classmate's homework. A 2012 survey of high school students ($N=22,924$) reports that 75% of the students admitted to copying another student's homework one or more times (Josephson Institute of Ethics, 2012). While I am not sure to what extent this is occurring at our school, this is a phenomenon that other teachers are also observing and are concerned about. Homework is a valuable learning tool, but only if it is quality homework and students put in the effort (Fan et al., 2017). If I remove the external carrot of assigning homework for a grade, there is an opportunity to encourage more meaningful homework practice. If homework is to be of value, students must demonstrate effort and integrity. My action research explores the effects of removing the grade from homework. Grades are more equitable when they reflect what students know and not their adherence to homework expectations. I was interested in investigating how removing the grade from homework affected student learning and homework completion.

Focus Question

My focus question was, To what extent does completing homework, without a grade or credit, affect student learning and homework completion rates?

My sub-questions include the following:

1. To what extent does completing homework, without a grade or credit, affect motivation to complete homework?
2. To what extent does ungraded homework affect student achievement on daily formative assessments and confidence on unit assessments?
3. In what ways does this impact me as a teacher?

CHAPTER TWO

CONCEPTUAL FRAMEWORK

The Great Homework Debate

Homework is a hot-button issue and the battle over homework is not a new one. A general consensus on what defines homework is “tasks assigned to students by school teachers that are meant to be carried out during nonschool hours” (as cited in Cooper, 1989, p. 86). The ebb and flow for and against homework reflect various changes in our culture over the years. Cries about too much homework can be traced back over 80 years (Kohn, 2006). With the 1957 launch of the Russian satellite, Sputnik 1, Americans wanted to be more competitive again and that pressure encouraged schools to increase the rigor to produce brighter young minds, one such way was in the form of homework (Marzano & Pickering, 2007). After the urgency to increase rigor waned, again the critique of homework resurfaced. Critics of homework reemerged, saying it was robbing our youth of their free time and creating family strife. Then a 1983 governmental report, *A Nation at Risk*, was published. The report signaled that poor schooling was partly to blame for the issues in our economy (United States, 1983). This reinvigorated the need for rigorous schooling, which was frequently interpreted as more homework (Kralovec & Buell, 2000). A vocal member of the anti-homework camp, Alfie Kohn, argues that homework decreases our student's inherent love of learning, cuts into family time, widens the achievement gap, and doesn't have any compelling benefit. While he agrees that there may be an association between increased comprehension and homework, he states that it does not necessarily imply causation (Kohn, 2006).

Others take an opposing stance and categorize the argument against homework as “popular,” taking aim at the enormous body of research that shows the effectiveness and the benefits of homework (Marzano & Pickering, 2007, p. 74). Nevertheless, there is an enormous body of research that does show the effectiveness of homework (Marzano & Pickering, 2007). For example, in a meta-analysis that aimed to measure the impact of homework on student learning, where some classes were randomly assigned homework and others not, students who were assigned homework scored, on average, better on the unit assessments than students in a class that was not assigned homework (Cooper et al., 2006).

When homework is implemented effectively, it can improve student learning, with summative assessment scores measuring an average of 23 percentage points higher than students who were in a class where no homework was assigned yet taught comparable material during the school day (Marzano & Pickering, 2007). While not all homework is effective for student learning, the data suggests that homework done correctly can be beneficial, implementing effective homework practices has a positive effect on student outcomes. In a study of students in grades 2-12 ($N=704$), there was shown to be a positive correlation between homework completed and student outcomes on both standardized tests and teacher-assigned grades, especially in grades six-twelve (Cooper et al., 1998). A different meta-analysis of 30 years of research paints a less compelling rationale for math and science homework but still found a small, but positive relationship. In their comprehensive study, the authors found “that, despite the inconsistencies across individual studies, overall, there was a positive, although somewhat weak, relationship between homework and performance in math/science areas” (Fan et al., 2017, p. 44).

Some proponents of homework associate benefits that extend beyond the increased positive effect it has on learning. While the primary goal of homework is to increase student achievement, there is also evidence that homework increases self-efficacy and self-regulation (Alleman et al., 2010). Homework can be used to not only support learning but also time management skills, self-regulation behaviors, and self-efficacy in students (Carr, 2013). Self-regulation is a required skill for students to manage their time and monitor their progress both inside and outside of class.

If students do not complete homework, they may miss opportunities to cultivate tools for independent work. This comes at the cost of lost opportunities to develop self-efficacy skills that result from independent work (Vatterott, 2018). Creating meaningful homework could be a step in the right direction in striking the balance between promoting self-efficacy and self-regulation. However, punishing students for not completing homework is unfair. They may have extraneous circumstances not conducive to completing homework. Some days it may be possible and necessary for students to practice science vocabulary and skills at home, and other times not.

As long as there is homework, there are sure to be parents, students, and teachers that have opinions on its merits. The relevance of this issue was highlighted on the cover of the California Educator February/March 2022 issue. California Educator, the California Teacher Association publication, explored potential bias in our grading policies. Grades should reflect what students know, not whether they submit complete assignments on time (Posnick-Goodwin, 2022). Including a homework score in a student's grade, whether for completion or accuracy, is rewarding compliance, encouraging copying, and punishing students who may not have the time and support outside the classroom. Homework is best served as a formative assessment tool for

teachers and a practice opportunity for students (Feldman, 2019). The “homework lady,” Cathay Vetterott (2018), questions when a student has Ds or Fs whether it indicates what they know or their lack of compliance to complete homework.

The goal of homework is to provide an opportunity to practice concepts and check if students are understanding the content before the summative assessment. Feldman (2019) also proposes that assigning a grade to homework (whether through grading for accuracy or completion) increases motivation to copy and decreases intrinsic motivation to learn the material. Removing a grade from homework can increase a student’s intrinsic motivation to complete the homework, decrease cheating on homework, and lead to a grade that more accurately represents what a student knows (Feldman, 2019). The implications of removing a grade could have a positive impact on student behavior and learning.

Homework as a Tool for Learning

Homework is an effective instrument to support the educational goals of content mastery. Effective homework assigned by the teacher, effective guardian/parental homework support techniques, and student learning can all increase content mastery in the classroom (Goodall, 2021). Goodall (2021) goes on to suggest that moving students towards intrinsic motivation for homework, by encouraging them to see homework as a learning tool, as opposed to extrinsically motivating them with grades and parental pressure. The research has shown that increased learning is not correlated with increased time spent on homework, but rather whether students are engaged in the learning and completion of the task (Cooper et al., 1998). Creating meaningful homework that students can use as an opportunity to learn, not as an exercise in compliance, is the goal. How do we encourage students to take ownership of their learning and make it theirs?

One teacher said, “I’ve never heard of a child not doing his work; it’s our work he’s not doing” (Vatterott, 2015, p. 49). Homework that has an academic purpose is an efficient use of student time, positively builds student competence in the content, and provides them with a sense of ownership are goalposts for homework assignments (Vatterott, 2018). Thoughtful homework design can also increase student participation when they see that the goal is learning.

Creating more meaningful homework starts with the teacher having a clear academic goal for the assignment. There are several ways that homework could be helpful to students, including, “prelearning, diagnostic, checking for understanding, added practice at the application level, and processing” (Vatterott, 2018, p. 104). Perhaps one of the most valuable and useful of these purposes is checking for understanding, as it gives us a window into where the students are on their learning journey (Vatterott, 2018). Without the penalty of a poor grade on homework grades, ‘homework becomes a safe place to try out new skills without penalty, just as athletes and musicians try out their skills on the practice field or in rehearsals” (Christopher, 2007/2008, p. 74). According to Bookhart et al. (2008), the most effective in-class tool teachers have to facilitate students taking ownership of their own learning is through formative assessments. Feedback is most effective prior to assigning a grade to it (Bookhart et al., 2008). It may be impossible to isolate whether students are learning from the homework or the in-class experience, but the goal is to provide opportunities for students to learn and monitor their progress along the way.

The students' job is to demonstrate learning. Homework is just one more tool to support them in accomplishing this educational endeavor. If we use homework as a tool for learning, it shows students there is “still time to improve” (Vatterott, 2018, p. 125). To maximize the

benefits of homework, the focus should shift from homework solely being used to assign grades towards being a data point for both teachers and students alike to check in with the learning and make necessary adjustments (Popham, 2008).

Homework becomes more meaningful when it is thoughtfully curated and strategically used. One step to accomplishing this is shifting the focus from merely “getting the points” to the intended purpose: learning.

Seeing homework as a tool for mastering the content is referred to as a mastery-approach to homework (Xu, 2021). A study released in 2021 of 1,450 Chinese eighth graders shows that a mastery-approach to homework positively impacted students’ demonstration of knowledge on summative assessments (Xu, 2021). Brookhart (2007), also heralds the benefits of learning when homework is used as a formative assessment to prepare for summative assessment. When homework is not just an entry in a gradebook, the student’s perception of homework can also shift. They can take ownership over their learning by using it to gauge their current level of comprehension. They can also ask questions and elicit more practice as a result (Brookhart, 2007). Removing the extrinsic reward of a grade for homework offers the opportunity for students to take control of their own learning (Feldman, 2019). Formative assessments can be used to help students gauge if they are on the right track with the concepts being learned in class. Homework is also a valuable tool for the teacher to see what students have mastered and what needs to be re-taught. When homework is assigned without a grade, it is not that it becomes optional, but rather a learning tool to help students monitor their progress in a course.

Sources of Methodologies

My action research focused on the effects of removing the grade from homework and then tracking student learning and retention of biological concepts. I did this by giving daily formative assessments that counted in lieu of the usual homework points. Examples of formative assessments, that provide both feedback to students and teachers on learning progression, can be found in the *Classroom Assessment Techniques* guide (Angelo & Cross, 1993). I kept track of the homework completion rates and how they compared to students' daily formative assessment scores and summative chapter assessment scores.

Unit test scores were used as an indicator of student achievement in demonstrating their understanding of biological concepts (Cooper et al., 2006; Vatterott, 2018). Each formative assessment was accompanied by a homework questionnaire. I used daily homework questionnaires to gather student perceptions on the effectiveness of the previous night's homework. The questionnaire also asked why the student did (or did not) complete the homework, as well as how beneficial the homework was to further the student's understanding of the concepts. Homework questionnaires can also aid in gathering data about student understanding and the helpfulness of the homework assignment (Cameron, 2012; Vatterott, 2018). Throughout the treatment period, I also kept a teacher journal to catalog study observations and perceptions (Cameron, 2012).

In an effort to assess the role that the copying of homework assignments played within my student cohort, I included this aspect in my investigation. While measuring the prevalence of copying is difficult, we know it occurs. To get an estimate of the level of occurrence, I gave students an anonymous questionnaire before the treatment period about their copying practices

(Josephson Institute of Ethics, 2012). I asked similar probing questions found in the Academic Reasons Survey implemented during a study by Flett, et al. (2016) to get a better understanding of why students did or did not complete their homework.

CHAPTER THREE

METHODOLOGY

Study Demographics

The two sections of Biology that I taught during the 2022-2023 school year were included in my study ($N=52$). Three students had a 504 plan, two students were classified as English Language Learners, and two students received special education services as guaranteed by their Individualized Learning Plan. The gender composition of the classes was 44% female and 56% male students. The class was composed of 83.3% freshmen and 16.7% sophomores. We are a high-performing high school in the state of California (California Department of Education, 2022) and the students in my study group overall demonstrate high motivation to succeed academically.

As mentioned previously, the homework completion rate in my Biology class was high. Prior to the study, over 92% of homework assignments were turned in. The research methodology implemented for this study was approved as exempt by Montana State University's Institutional Review Board (Appendix A).

This action research project was designed to evaluate the effects of graded homework on student learning. The percentage of homework completed, the daily formative assessment scores, the summative unit assessment scores, as well as student confidence and motivation were all recorded. The treatment was designed to determine to what extent ungraded homework affect student learning and homework completion rates. In addition, what motivational factors affect

student homework completion rates? And finally, how does this research and results inform my daily practice and perceptions of homework?

Treatment

The study period for my action research spanned four Biology units; both sections of Biology were exposed to the treatment for two units of study and non-treatment for two units of study. Each unit was about three weeks long. During each unit in the study period, students were assigned approximately eight homework assignments prior to the unit assessment. Throughout the entire study period, students were assigned homework daily, given daily formative assessments based on the previous night's homework, and answered homework questionnaires. Daily formative assessments were scores for accuracy. While these scores did not go into the gradebook, the feedback was intended to help students understand where they stand in their comprehension and to track student learning over the unit. Students received completion points in the gradebook for completing the daily formative assessment. Homework assignments, such as POGIL handouts, textbook questions, or Edpuzzle videos, are designed as a review or an opportunity for students to dive deeper into the concepts explored in class. Appendix B provides a sample homework assignment, Cellular Growth Reading Guide, which was assigned for homework after an in-class investigation modeling cell size and diffusion rates and cell cycle notes. My philosophy is that students should not be held accountable on their assessments for information that is only presented in homework, without being discussed in class. During the treatment units, students continued to submit their completed homework at the beginning of the class for data collection purposes only. Failure to complete the

homework assignment during the treatment period was not recorded in students' grades.

During the non-treatment period, however, students would receive a zero in the gradebook.

During the study period, both sections of Biology participated in the treatment and non-treatment together. The effects of the treatment were compared to the data collected during the non-treatment units.

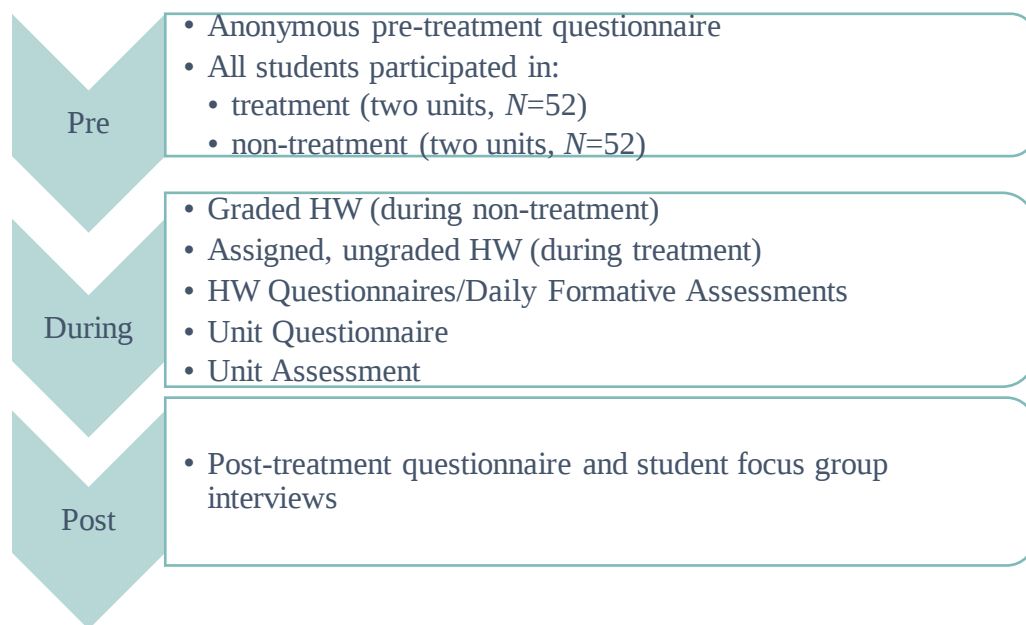


Figure 1. Flow chart of the data collection process.

Instruments

Prior to treatment, students completed a pre-study questionnaire to elicit their perceptions about homework and the prevalence and motivating factors for copying (Appendix C).

Throughout the study period, I collected observations and reflections in my teacher treatment journal (Appendix D). During treatment, while the homework was ungraded, students continued to turn in completed or partially completed homework so I could track homework completion rates. During the treatment, students completed a daily formative assessment based on the

homework, which was accompanied by a homework questionnaire (Appendix E). During non-treatment units, students completed a daily homework questionnaire (Appendix F). At the end of each unit, students' content knowledge was assessed by taking a unit assessment. Each unit assessment was followed with a unit assessment questionnaire (Appendix G). The unit assessment questionnaire asked students to reflect on 1) how helpful they thought homework was in supporting their learning over the course of the unit and 2) how confident they felt with the content. At the conclusion of the study period, I conducted focus group interviews (Appendix H) to gather reflections on their experience with, and preference of, each condition applied.

The data triangulation matrix (Table 1) lists all the data collection methods and indicates how they address each research question. The validity of my instruments was ensured by reviewing previous capstones that addressed homework, developing them in conjunction with my colleagues, and they were reviewed by my MSSE advisor. The accuracy of the data collected with the outlined instruments is further supported by the triangulation of data from the multiple instruments implemented.

Instrument analysis. The data collected was organized for analysis. The percent of homework completed by each student was calculated based on all the homework assignments for the unit. Students received a 0 (incomplete), 1 (mostly incomplete), 2 (mostly complete), and 3 (complete) for each homework assignment. If a student was absent, I excluded the homework from their overall score and based it only on the completion of the assignments that they were present for. Formative assessment scores were tabulated in the same fashion as the homework to determine each student's average daily formative assessment score per unit. Student quotes were

analyzed for themes using the program NVIVO. Using NVIVO, qualitative data was uploaded, coded, and analyzed for common themes and patterns.

Table 1. Data Triangulation Matrix of data collection instruments implemented.

DATA COLLECTION INSTRUMENTS	PRE-QUESTIONNAIRE	TEACHER TREATMENT JOURNAL	DAILY FORMATIVE ASSESSMENT	HOMEWORK QUESTIONNAIRE	UNIT QUESTIONNAIRE	UNIT ASSESSMENTS	POST-INTERVIEW
<i>Research Question</i> To what extent does completing homework, without a grade or credit, affect student learning? and homework completion rates?	1	2	3,4	1,3	1,3	5	1
<i>Sub-question #1</i> To what extent does completing homework, without a grade or credit, affect motivation to complete homework?		2		1,3	1,4,5	4,5	1,2
<i>Sub-question #2</i> To what extent does ungraded homework affect student achievement on daily formative assessments and confidence on unit assessments?		2	1,2,4	1,3	1,4,5	4,5	1,2
<i>Sub-question #3</i> In what ways does this impact me as a teacher?	2	2	3,4	3	3	5	2

Data Collection Methods Key

1. Qualitative data – student opinions, perceptions, and insights.
2. Qualitative data – teacher opinions, observations, perceptions, and insights.
3. Quantitative data – homework completion rates, student perceptions of homework helpfulness.
4. Quantitative data- progression of content mastery throughout treatment.
5. Quantitative data – retention of content.

CHAPTER FOUR

DATA ANALYSIS

Results

I analyzed student homework completion rates and scores on unit assessments to measure the effect of removing a grade from homework on student learning and homework completion rates. There was a total of 54 students enrolled in my two sections of Biology during the study period. However, I omitted data from a student who completes a modified curriculum per their individualized education plan and a student who missed the majority of the study period due to chronic absenteeism.

Homework Completion Rates and Motivational Factors

During the treatment unit when homework was ungraded, the homework completion rate was significantly less, as seen in Figure 2. The mean homework completion rate decreased from 87.0% in the units with graded homework to 62.8% in the units with ungraded homework.

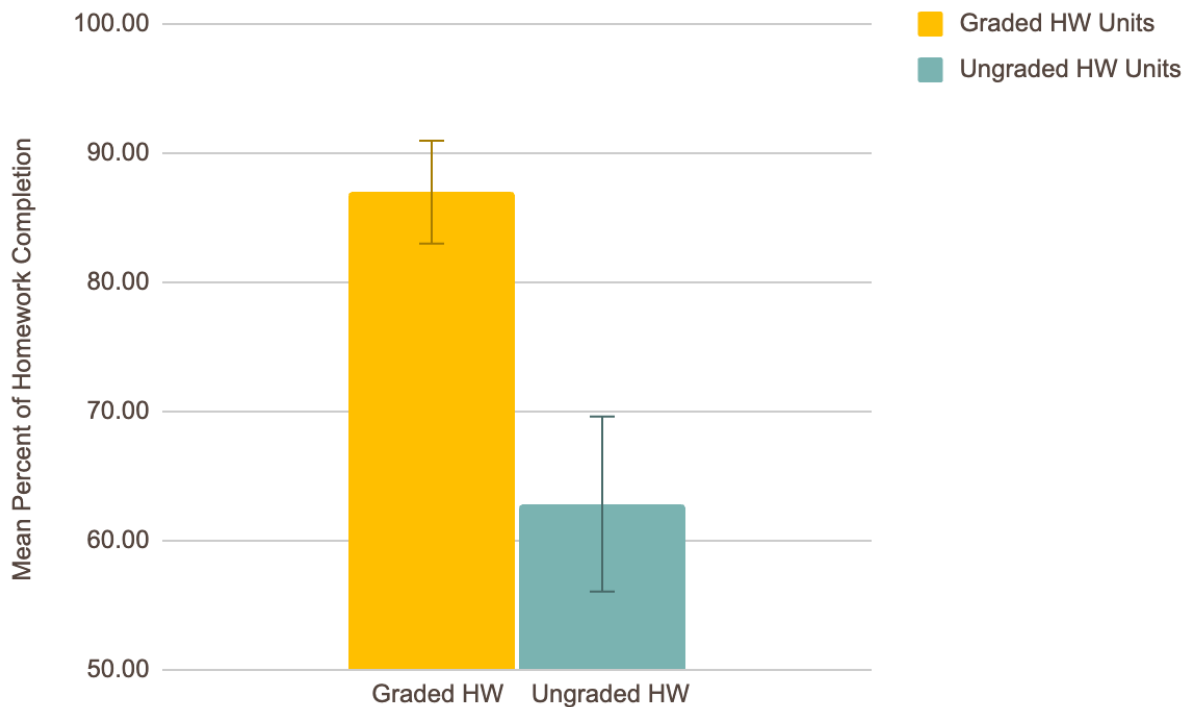


Figure 2. Mean HW completion percentage during the units with graded HW ($N=52$, number of homeworks=546) compared to units with ungraded HW ($N=52$, number of homeworks=693), error bars show two times the standard error.

Students are motivated to complete homework to accrue points, but also for learning and practice. While homework completion decreased when homework was ungraded, the driving factors motivating students to complete their homework remained relatively constant (Figure 3). A variety of factors motivated students to complete their graded and ungraded homework. Based on Likert Scale responses given after each homework assignment, the majority of respondents indicated they “agree” or “strongly agree” that they completed the homework in order to accrue points, to understand the subject, because it is the expectation, and/or they believe it will help them score better on the test. Notably, ninety-one percent of the students “agree” or “strongly agree” that they complete the homework for points. Students further disclosed that when the Biology homework was ungraded it took a backseat to graded homework, “I really wanted to and

I felt bad for not doing it. I just had a lot of shows and rehearsals, so I had to do my required homework first.” Another student said, “Personally, I like having graded homework because a lot of times I need that extra pressure to get it completed.”

Students also expressed that when homework was ungraded they had more autonomy to decide which assignments they needed to complete based on their perceived understanding. One student explained that they skipped assignments when “I already understood the stuff we were learning.” Another student echoed this sentiment when expressing why they didn’t complete ungraded homework, “I didn’t think completing the assignment would be helpful to me, because I already understood the topic.” During the ungraded homework units, fewer students indicated that one of the motivating factors to complete homework was because it was the expectation. Responses dropped from 91% to 81% of respondents saying they “agree” or “strongly agree” that they complete the homework because it is the expectation (Figure 3). The range in *n* values is due to the fact that the same 52 students in the study were asked the questions multiple times and not every student answered every question.

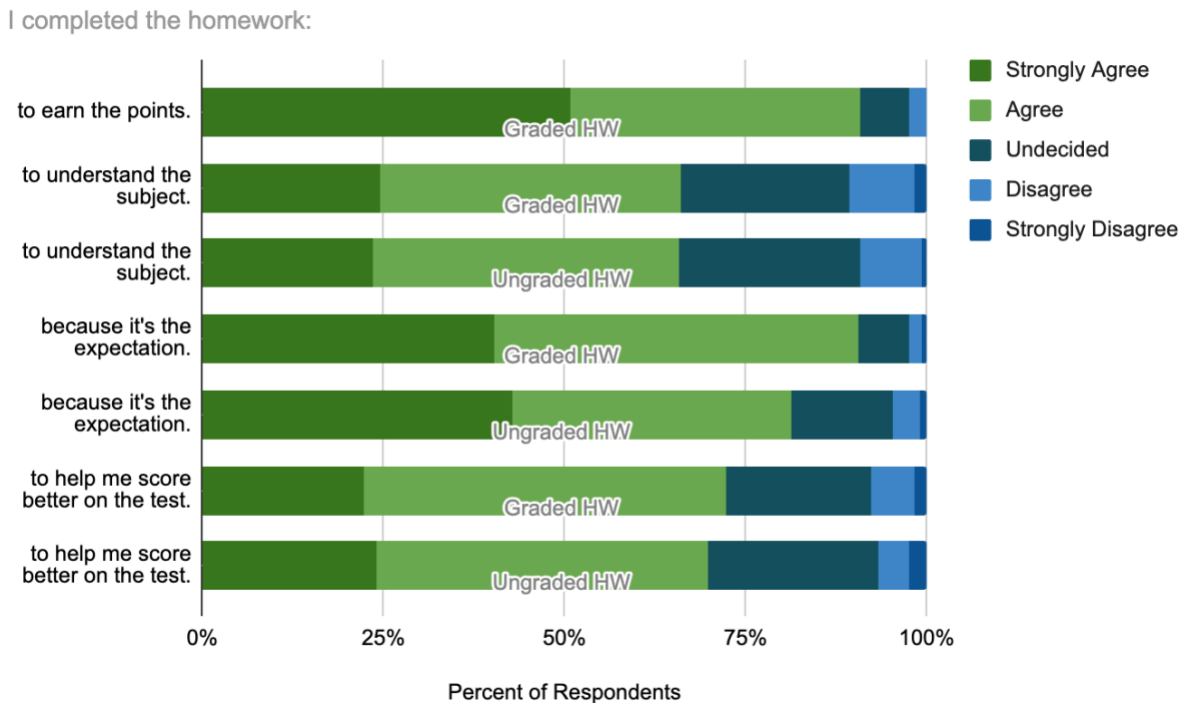


Figure 3. A comparison of motivating factors to complete the HW during units with graded HW (N=27-52, n=129-130) and units with ungraded HW (N=24-51, n=512-519).

Unit Assessment Scores

During the study period, graded homework was provided during Unit 4 and Unit 6. Ungraded homework was provided during Unit 5 and Unit 7. Graded homework is effective at supporting student learning. While students completed less homework when it was ungraded, the effect on assessment scores was not significant. Figure 4 compares the mean summative assessment scores in the four units included in the study period. It should be noted that students scored better with graded homework than with ungraded homework. The mean unit assessment scores with graded homework were 90.0% and 85.0%. The mean unit assessment scores with ungraded homework decreased to 82.5% and 81.9%. Student unit assessment scores were much higher on Unit 4 than the other three units included in the study, possibly reflecting the nature of

the content in Unit 4. Unit 4 drew on previous content knowledge from middle school and was the shortest unit of study. Unit 4 assessment scores were significantly higher than the unit assessment scores when homework was ungraded. When compared to the mean scores from all other units in Biology this year that did have graded homework, the treatment units from this study are not the lowest (Appendix I). Compared to the other unit in the study that had graded homework, Unit 6, the units with ungraded homework were not significantly different. Students' mean scores on unit assessments with ungraded homework were lower, suggesting that graded homework may be beneficial for some students. A student who preferred graded homework stated, "My preference would be the graded homework because I like the idea that it got me more motivated to do the homework."

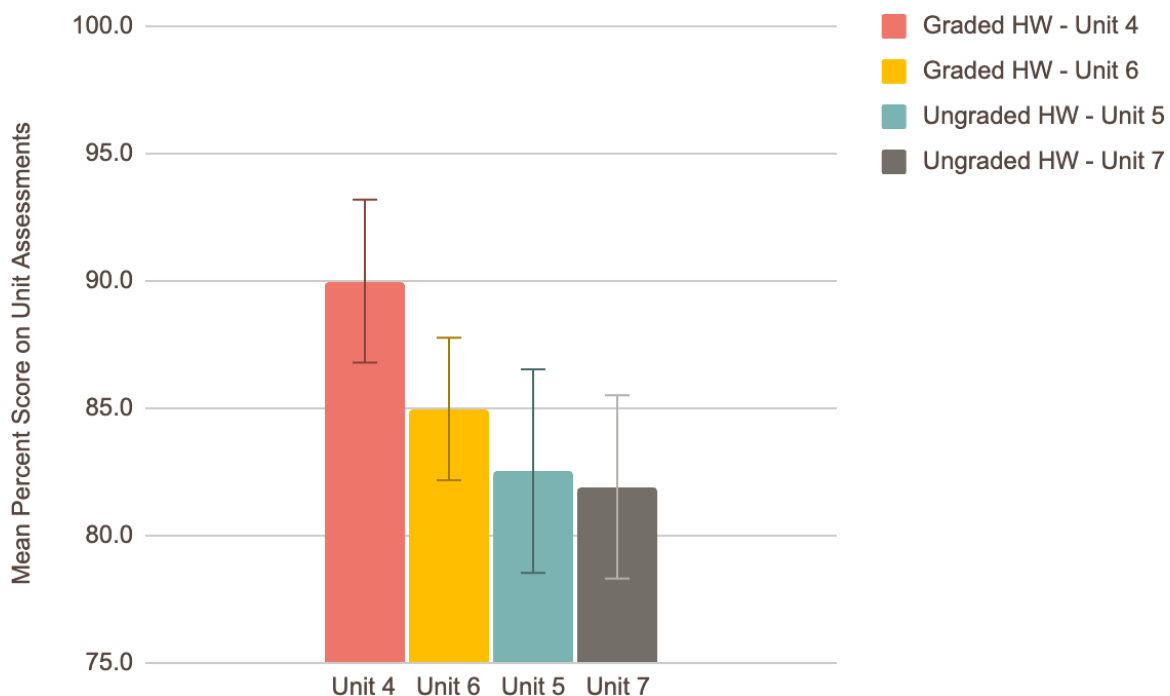


Figure 4. Mean percent score on unit assessments with graded HW, Unit 4 and Unit 6, compared to unit assessments with ungraded HW, Unit 5 and Unit 7, error bars show two times the standard error, ($N=52$).

Formative Assessments and Student Achievement

The percent score on formative assessments for each student was averaged. There is no significant difference between the mean formative assessment score within the units with graded homework and within the units with ungraded homework (Figure 5). There is also not a significant difference between the mean formative assessment scores in the units with graded homework compared to the units with ungraded homework. It may also indicate that homework completion does not have a large influence on student content understanding throughout the unit. This may indicate that completing homework is not as significant to student achievement as the learning that takes place in class.

Based on student feedback, students viewed the daily formative assessments as an alternative way to obtain the homework points. This perspective can be highlighted in a quote from a student who thinks the prompts from the formative assessments are a good alternative for students who do not have time to complete homework outside of class,

So I feel like people who don't have the time should still have a way to get those points, like with the prompts [daily formative assessments]. I felt like with the prompts it was a lot easier because if I didn't have the time to finish my homework I was still able to get those points from the prompt.

The goal of the formative assessments was to encourage self-efficacy in student learning, an opportunity for students to check in on their learning progress. Some students used the formative assessments this way. One student expressed, "If the very next class you cannot remember what we learned you need to do the homework." There is no significant difference between the mean average on formative assessments during graded versus ungraded homework units, yet students completed significantly less homework during the ungraded homework units.

This may indicate that the homework did not have a significant effect on students understanding of the content.

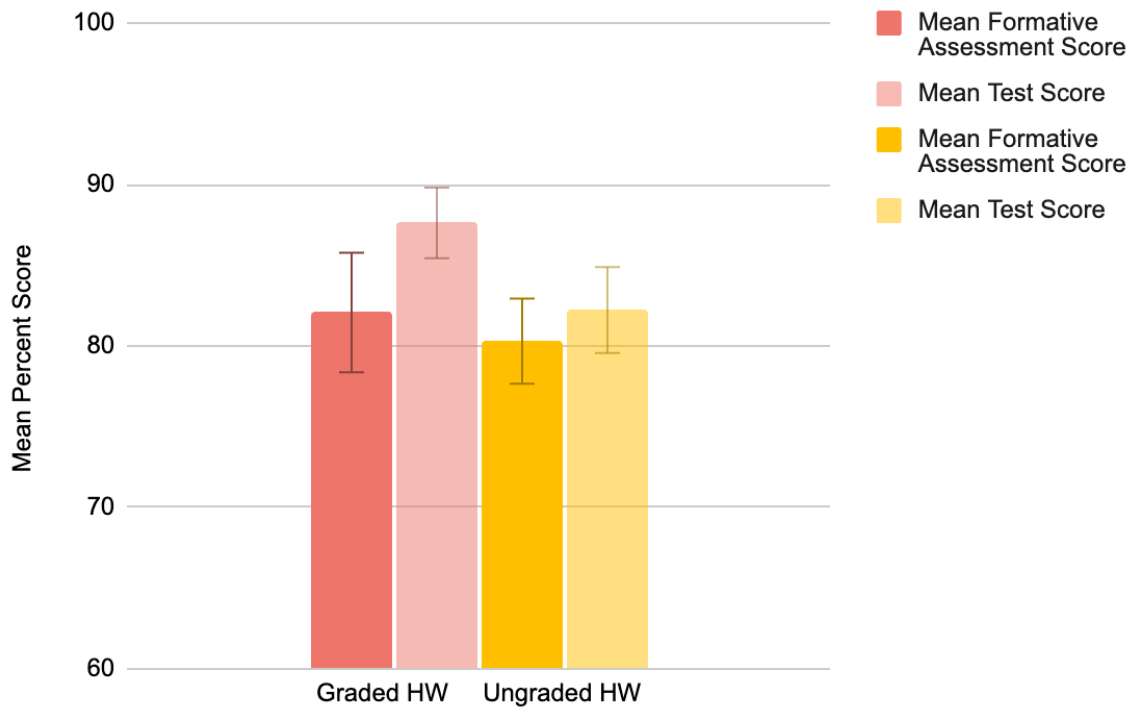


Figure 5. Mean percent score on daily formative assessments ($N=52$, number of daily formative assessments=458) and mean percent score on the unit assessments ($N=52$, $n=104$) with graded HW and mean percent score on daily formative assessments ($N=52$, number of daily formative assessments=700) and mean percent score on the unit assessments ($N=52$, $n=104$) with ungraded HW, error bars show two times the standard error.

The percentage of homework students completed is not a strong predictor of student scores on the associated unit assessment. While the correlation is positive, the relationship between homework completion and assessment scores is weak. The R^2 correlation value between homework completed and unit assessment scores during graded homework units was 0.091 (Figure 6). The R^2 correlation value between the homework completion and the unit assessment scores during ungraded homework units, was 0.228 (Figure 7). While neither indicates a robust, or even moderate, correlation between homework completion rates and unit assessment scores, I

do think that it is interesting that there is a larger R^2 value when homework is ungraded. The higher correlation between homework completion and unit assessment scores, when homework is ungraded, may indicate that homework completion is a stronger predictor of success on unit assessments when the homework is ungraded as opposed to graded.

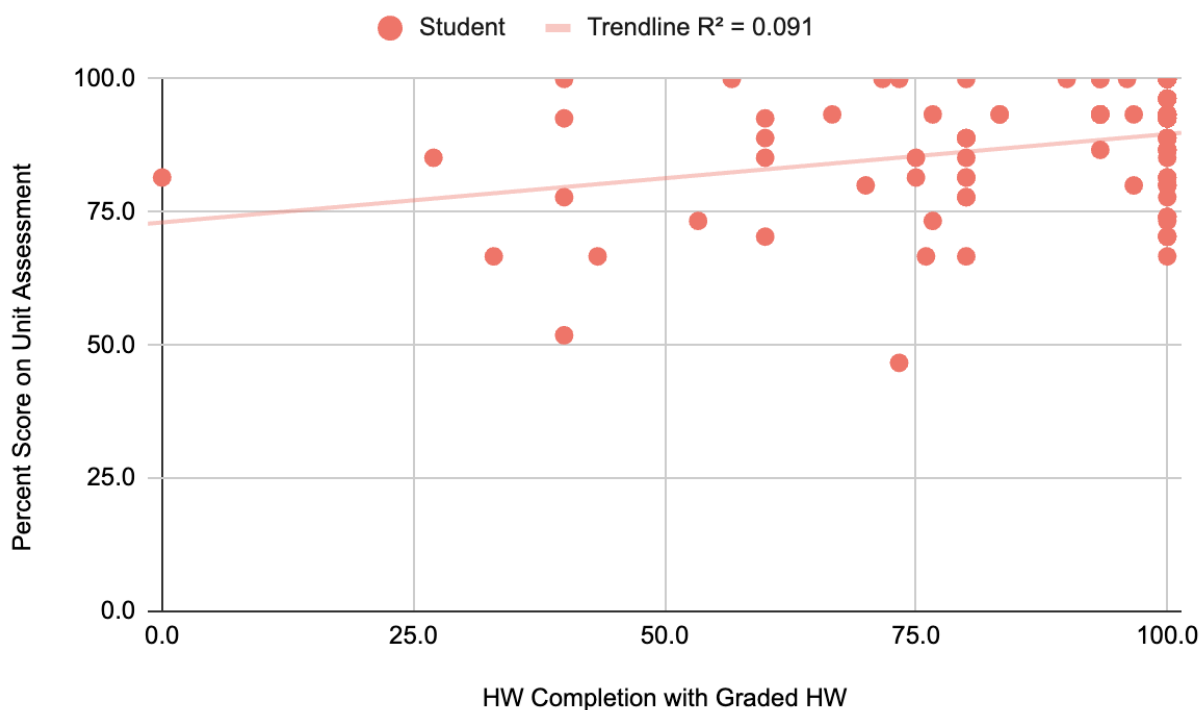


Figure 6. The correlation between the percentage of homework completed ($N=52$, number of homeworks=546) and unit assessment scores during units with graded homework ($N=52$, $n=104$).

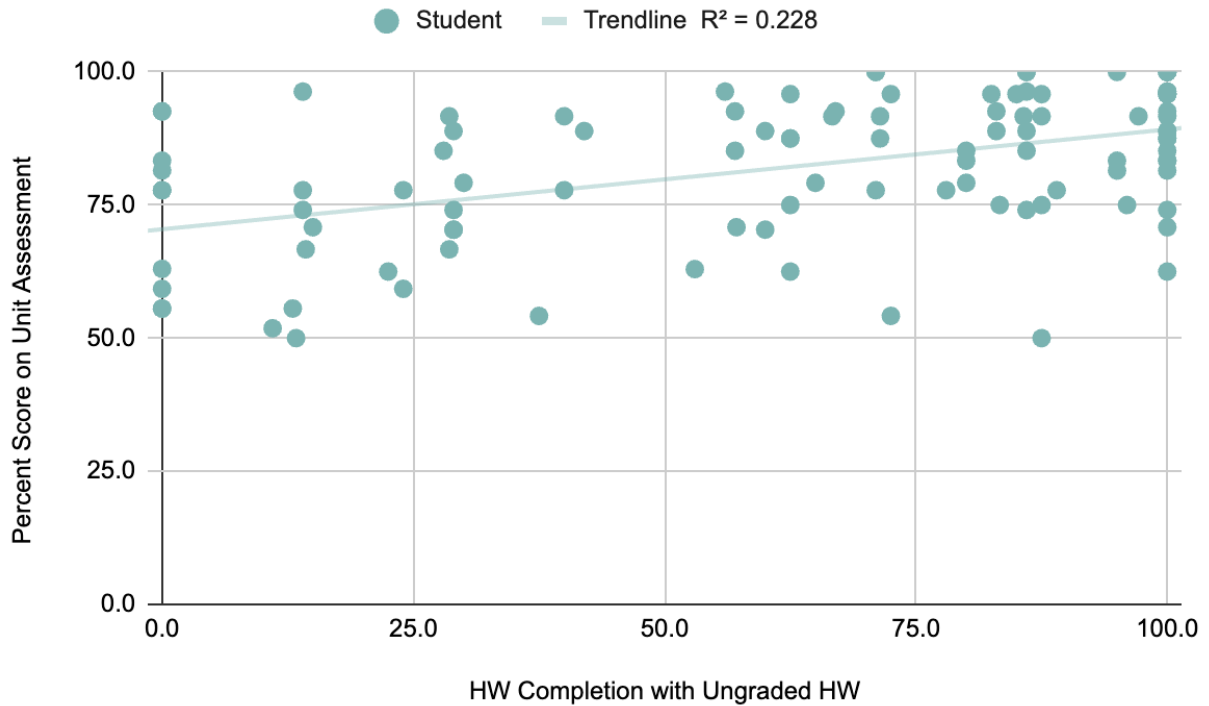


Figure 7. The correlation between the percentage of homework completed ($N=52$, number of homeworks=693) and unit assessment scores during units with ungraded HW ($N=52$, $n=104$).

Additionally, the correlation between unit assessment scores and student confidence on unit assessments is noteworthy. When graded homework units (Figure 8) are compared to the ungraded homework units (Figure 9), both exhibit a very weak correlation between unit assessment scores and student confidence on the unit assessment. After each unit assessment, students completed a Unit Assessment Questionnaire (Appendix G). Students ranked how correct they thought their unit assessment scores were after they completed the assessment: Extremely correct (5), Mostly correct (4), Somewhat correct (3), Mostly incorrect (2), and Not at all correct (1). However, the difference in R^2 between student confidence and homework completion rates on graded homework units versus ungraded homework units should be noted.

The graded homework units had weak negative correlation ($R^2=.005$) whereas ungraded homework units had a weak positive correlation ($R^2=.056$).

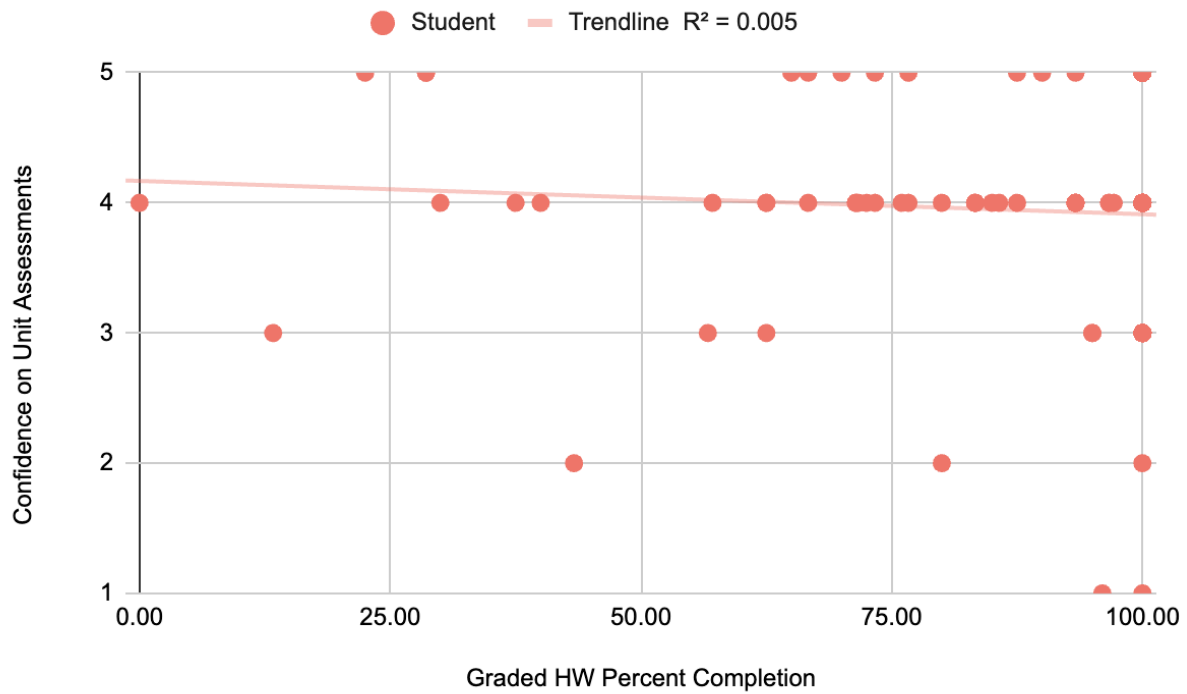


Figure 8. The correlation between the percentage of homework completed ($N=52$, number of homeworks=546) and student confidence on the unit assessment with graded homework ($N=52$, $n=88$).

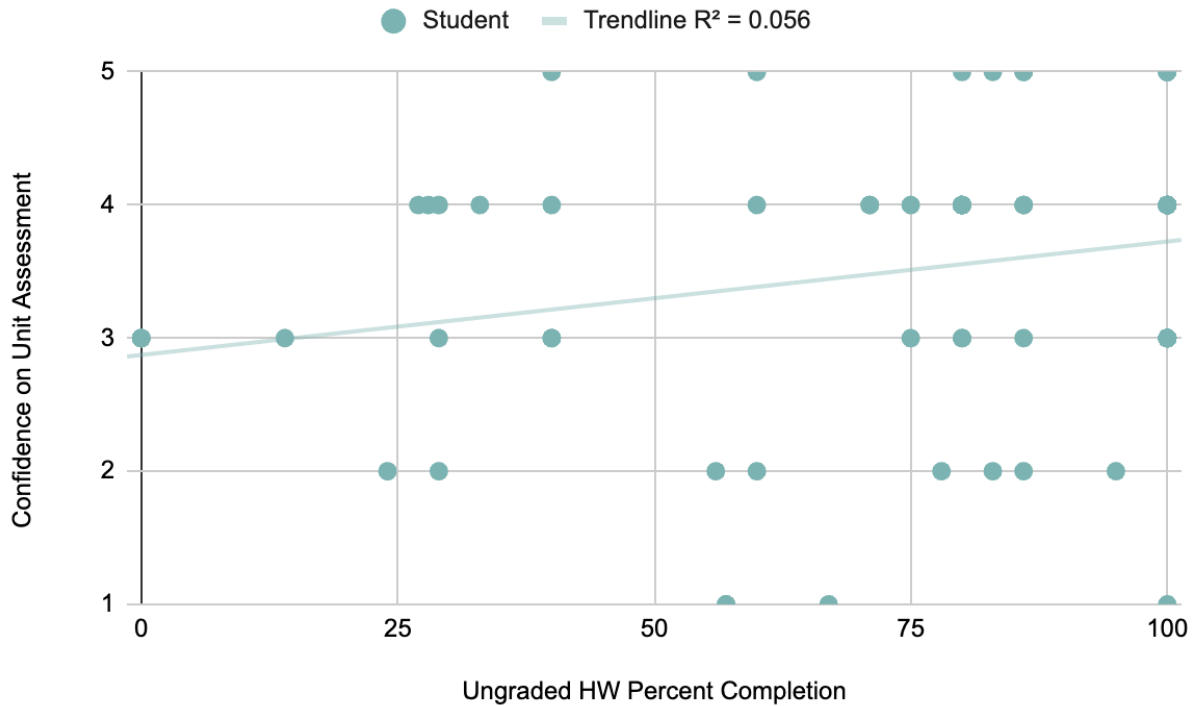


Figure 9. The correlation between the percentage of homework completed (N=52, number of homeworks=693) and student confidence on the unit assessment (N=52, n=74) with ungraded homework.

During interviews, students expressed that the prevalence of copying homework assignments decreased when homework was ungraded. When asked about what motivates students to cheat in a whole class interview, one student explained, “The only reason people would copy before is to get the grade in the gradebook. When it is not graded there is no point in copying.” Another student added, “If you copy you are not going to really understand it anyway.”

Homework may not be necessary for all students all of the time. While most students preferred the ungraded homework, many saw value in the grades associated with the points. One student remarked,

Having homework not be graded, and rather an option, allows students' course over the year to be more tailored to their needs rather than this sort of catch-all. You could perfectly understand everything in class and then go home and have apathy to complete something that you already picked up on.

While one might expect that a student's confidence would increase along with higher rates of homework completion, that is not indicated in the data. The weak correlation between student confidence and the percentage of homework a student completed highlights that the percentage of homework completed is not a reliable predictor of how confident a student will be on the unit assessment.

While the percentage of homework completed was significantly lower during ungraded homework units, the data does not indicate that there is a significant difference in student learning when measured by daily formative assessments nor unit summative assessments (note that the Unit 4 summative assessment was significantly higher). While student achievement was maintained throughout the treatment units, it is noteworthy that there is a weak, but positive, correlation between student confidence on unit assessments and the percentage of ungraded homework that they completed. Daily formative assessments that were administered throughout the study period show no significant difference between the mean formative assessment score within graded homework units and ungraded homework units.

CHAPTER FIVE

CLAIM, EVIDENCE, AND REASONING

Claims from the Study

The goal of this action research project was to measure the effects of a modified homework grading practice on student learning and homework completion rates in the Biology content. Based on the focus questions of this project, three claims can be made: (1) students completed more homework assignments when it was graded; points are an underlying motivating factor, (2) graded homework did not significantly produce overall higher test scores, and (3) graded homework did not significantly improve daily formative assessment scores.

Claim One

The first claim states that students completed more homework assignments when it was graded; points are a motivating factor. During the graded homework units, students had an overall homework completion rate of 87.0%, compared to 62.8% during ungraded homework units. Most students indicated the following factors as motivators to complete their homework: to earn points, to learn the material, the fact that it is a course, parent expectation, and to prepare for tests. Students reiterated these sentiments in focus group interviews. One student explained the expectation to complete their homework, “I always feel the need to do the homework whether it is graded or not because that was what I was given.” Another student agreed and said, “I do the homework because that is the expectation from you and my parents.” During the unit with ungraded homework, students could choose to complete only the homework they deemed

helpful. A student who preferred the ungraded homework said, “I kinda liked the grading period where we had ungraded homework because I felt like if I learned the material in class then I didn’t need the extra homework. Sometimes I didn’t feel like I understood what we were doing in class, so I did the homework and the prompts [daily formative assessments] helped a lot.” A student who preferred the graded homework expressed support for the power of the points, “I really think having the homework be worth points gives more motivation towards completing it.” While students may be motivated by several factors to complete their homework, when it is worth points, they are more likely to complete the assignment.

Claim Two

The second claim states that graded homework did not significantly produce an overall higher test score. The percent homework completion was significantly less during units with ungraded homework. That trend is not mirrored in the unit test scores. While Unit 4 assessment scores were significantly higher than the ungraded units, it also had the highest mean score of all unit assessments in Biology (Appendix I). The variation displayed between Unit 4 and all units in Biology (in and outside of the study period) could have outweighed any variation due to the benefits from graded homework during Unit 4 specifically. Apart from Unit 4, when mean scores of assessments with graded homework are compared to mean assessment scores from units with ungraded homework, they are not significantly different. Students’ mean scores on unit assessments with ungraded homework were lower, suggesting that graded homework may be beneficial for some students.

When homework was ungraded students may not have taken the opportunity to complete homework for the practice and learning. A student who preferred the graded homework units

said, “Homework should keep getting graded as it helps no one if it isn't, the first time with no grading caused me to get a 77% on the unit test though with grading I got a 95%. I think grading should be kept.” While another student who scored 100% on all four of the unit assessments in the study period said,

In my opinion, homework should not affect the student's grade. If the student is already cognizant of the material and is confident about their knowledge of the material, they should not be penalized for not doing the assignment. Homework should still be an option for those who do want to review or need to catch up.

Another common theme that students express is that “If homework is just for practice and stuff it doesn't really make sense to make everyone do the same amount of practice because everyone needs different amounts of practice. So, like if someone already understands it then it just wasting time that could be used for other work.”

One student highlights the other potential benefit of homework in addition to learning: self-regulation and self-efficacy. The student said if they were a teacher, “I would give homework as it provides additional learning and teaches responsibility and consequences.” When students do not complete the homework, it could be more about prioritizing assignments that have a point value and less about monitoring their learning in Biology. A student touched on this idea saying, “I had a lot of other work and since I am not marked down for completing this homework it's not a priority. Sometimes it can be nice to not have to do it, but it can make me get behind.”

When there is a grade attached to work completed outside of class, that is not equitable for all students. One student addressed the issue of equity, “I feel people's lives at home are not equal, so it is unfair to give work at home.” In conjunction with ample learning opportunities in class, and when homework is primarily assigned for review and practice, graded homework is

not necessary for every student to master content and demonstrate learning. I understand students' rationale for preferring ungraded homework. However, the best homework policy is one that supports all the diverse needs present in a student population. The policy should account for those students who are motivated by points and those who might have stronger self-regulatory skills, understanding what they need to do for their own learning.

Claim Three

The third claim states that when homework is graded, students do not demonstrate significantly more learning on the daily formative assessments. There is no significant difference between formative assessment during graded and ungraded homework units. This may indicate that what we do in class has a larger impact. Many students indicated that the notes, labs, and activities we do help them learn the content during class time. One student highlights the benefit of in class learning opportunities such as labs, "Labs help me understand the material better, such as the stomata one."

Another interesting observation about ungraded homework is that it may be a better predictor of how students will score on an assessment. In both the units with graded and ungraded homework, there is a positive correlation between the percent homework completion and student scores on the unit assessment. Students who completed more homework tended to score better on the assessment while students who completed little to no homework tended to score lower. While it is a weak correlation, the correlation between the two variables is stronger in the units with ungraded homework. The R^2 value for the units with graded homework is 0.091 and the R^2 value for units with ungraded homework is 0.228. This suggests that when students are not given a grade for homework, they complete it with more fidelity - for the learning. This

may show that when students complete homework for learning they get more out of it educationally.

Students who completed more homework tended to feel more confident after the unit assessment, while students who completed less homework tended to feel less confident on the unit assessment. While it is a weak correlation (Figures 8 and 9), there is a positive correlation during the units with ungraded homework and a negative correlation during units with graded homework.

During the units with ungraded homework, I did not observe students frantically copying another student's paper, or rushing to complete their homework before class, nor did I encounter verbatim responses from student to student on written homework questions. This may indicate that the students who did the homework did the work themselves, which translated into understanding the content better. This may also explain why some students who appeared to have completed the homework when it was graded did not have unit test scores that reflected these efforts. Students also reported a decrease in copying during the ungraded homework units. One student said, "There is no reason to cheat" and another echoed that sentiment and said, "More people wanted to copy with graded homework." During the focus interview, students agreed that they did not see students copying during the units with ungraded homework and did see students copying during the units with graded homework. While fewer students completed their homework during the units with ungraded homework, the homework may have become more of a tool for learning and less of a box to check for many students.

In response to my focus question, homework is an educational tool that can increase student mastery of content in Biology. Regarding my first sub-question, acquiring points is a

motivating factor behind homework completion for students. When homework is provided, but not graded, fewer students complete the assignment. With respect to my second sub-question, daily formative assessment scores were not significantly different between graded and ungraded homework units.

Value of the Study and Consideration for Future Research

After taking a deep dive into homework policies and practices, many questions still remain. What is the purpose of homework? Review? Enrichment? Extension of learning? For this study, the homework I assigned was mostly review and practice. Ideally, it would have been beneficial to implement the treatment upon a greater number of units. Both sections of Biology participated in the treatment during the same units. It would have been interesting to flip-flop the homework policy (graded or ungraded) and see how that affected unit assessment scores. It is also important to note that many top students were able to complete their homework during class. They would often finish classwork with time to spare and would use their time to complete the homework in class.

This research has really illuminated the history and strong opinions found in both homework “camps” for and against compulsory homework. It was amazing to see that the same references were used as evidence for and against using homework. There are so many ways to synthesize various findings to best support student learning. While there is substantial research on how to make homework meaningful, there are growing calls to ensure our grades are more equitable. Grades are more equitable when they reflect what students know, and when grades are not used punitively against missing homework assignments. The challenge is trying to pull the best strategies from the literature to support student achievement. Sometimes the best strategies

seem to conflict (i.e. homework increases student achievement, but it is inequitable to expect students to complete homework after school). Students thought the daily assessments were helpful to their learning. Implementing these quick formative assessments was challenging. I wanted to ensure that students received timely feedback, which is most streamlined for me when students complete a Google Form. However, that seems to add another layer of classroom management and transition time. On several occasions, such as on October 27, 2022, I noted in my Teacher Treatment Journal that the students were very chatty during the daily formative assessment. I will continue to test more streamlined ways to maximize class time while also getting students timely feedback on formative assessments.

Moving forward I may want to include homework in the gradebook, but as a zero-weighted category. In other words, provide homework, review homework, and keep a record of homework completion. With a zero-weighted category, compliance or non-compliance will not influence a student's grades. Another option I may implement is to designate some homework assignments for points while others will be ungraded as review. I know this action research project was just one step of many in working to provide my students with the best educational opportunities that support the diversity of students' needs.

One question that I was not able to answer based on my instruments, was whether or not students' primary reasons for completing homework changed as a result of this study. One of the premises for assigning ungraded homework is to see if it increases intrinsic motivation to complete work outside of class. While I collected data on the reasons that students completed their homework, it would have been also beneficial to have students rank their motivational

factors for completion. With additional questions, I might have been able better assess primary motivations for completing homework and determine if that changed when graded and ungraded.

Impact of the Study on the Author

Throughout my action research project, I have learned so much that cannot be captured by my data. My goal as a teacher is to support my students in becoming scientifically literate citizens while engaging their sense of wonder while supporting their development as students. Involving my students in my own learning was a special experience. I was modeling that we are always learning and improving, and I think that was surprising and eye-opening for my students to see. As with many things in education, there is no perfect solution for homework that will benefit all students all of the time.

During the treatment units, I particularly enjoyed the removal of pressures often associated with students turning in their homework assignments at the beginning of class. During the treatment units, removing the grade from homework also removed some of the more challenging interactions I have had with students at the start of class. I didn't have to negotiate with students who forgot to complete their assignment or check in with students who were trying to scramble to complete the assignment that was due. It further extended opportunities for connection and conversation. Throughout the treatment units, I observed that most of the serious, high-achieving students continued to complete most of their homework.

Over the years, when students have complained about homework, I felt my justifications for assigning it were not robust. I was assigning homework because that was the expectation at my school site, what had been the norm in my own high school experience, and what was supported in my own teacher training program. This action research has given me the

opportunity to learn more about the pros, the cons, and allowed me to delve into the associated research with assigning homework. Honestly, I was very nervous to implement this treatment. What if all the students failed the tests during the units with ungraded homework?

There were noticeably fewer homework assignments being submitted to the inbox during the units with ungraded homework. It was noticeable enough for me to record this observation in my Teacher Treatment Journal. One such entry was made on January 12, 2023, when I described the lack of completed homework assignments. There was a lot of excitement in the classroom, greeted with cheers, when we would move from a unit with graded homework to a unit with ungraded homework. As included in my teacher treatment journal on January 19, 2023, one student said, “I’m so glad we don’t have to do the homework! I have plenty and I don’t have time.” Even when homework was ungraded, I observed students using homework as a learning tool. In my Teacher Treatment Journal on January 21, 2023, I recorded a student’s request to review an ungraded homework assignment with me one more time before the test. This demonstrated their focus on the learning and not an attachment to the grade. This research has given me the confidence to question norms and continually work to improve my practice in a systematic way through the action research process. What I found was that students continued to demonstrate learning on their assessments without graded homework. Additionally, it deepened my conviction and understanding that what we do in class is incredibly important, if not most important, for student learning in Biology.

Students received feedback on daily formative assessments in all the units of the study; whether the homework was graded or ungraded. It would be interesting to measure the effect of the formative assessments on student learning and achievement on summative assessments. A

future research area for study would be to investigate if there is a correlation between the implementation of daily formative assessments and summative assessment scores.

As a school site, we were asked to implement a grading for equity practice, such as removing the grade from homework, during the spring semester. I was excited to find myself ahead of the game and had also already collected a lot of data to go along with it! Designing and implementing an action research project has given me the tools to facilitate discussions around improving our educational practices with my colleagues. This skill set that I have developed with my action research is helpful to facilitate progress and change. The planning and implementation of these changes in our classroom, while measuring the actual *impact* of these actions, can bring about a much-needed reevaluation of what works and what doesn't. This process has given me additional confidence as I continue to engage in professional growth in my practice as a science educator.

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APPENDICES

APPENDIX A

INSTITUTIONAL REVIEW BOARD EXEMPTION

10/15/22, 11:57 AM

Gmail - IRB Protocol #2022-303-EXEMPT APPROVED



Amanda Mello

IRB Protocol #2022-303-EXEMPT APPROVED

1 message

NoReply@topazti.net <NoReply@topazti.net>

To: walter@montana.com

kelly.beiswanger@montana.edu

Mon, Oct 10, 2022 at 8:00 AM

Hello Mello, Amanda,

Your protocol was reviewed by the IRB and has been approved.

PI: Mello, Amanda

Approval Date: 10/10/2022

Title: The Effects of Non-Graded Homework on Student Learning and Homework Completion Rates in a High School Biology Classroom

Protocol #: 2022-303-EXEMPT

Review Type: Exempt Review

Expiration Date: 10/10/2027

Work described under this protocol may now commence. The PI is responsible for ensuring that the protocol accurately describes research practices being conducted.

- > Review Category designation determined by the IRB can be found in the final section of your protocol.
- > IRB-stamped active Consent Forms are attached within your protocol where applicable.
- > Any changes must be submitted via Amendment prior to implementation.
- > Per the Common Rule, research only requires Interim (annual) Review by the IRB if 1) it was reviewed via Full Committee or 2) is sponsored by the FDA.
- > All research is subject to post approval monitoring.
- > All protocol types must be renewed 5 years after approval.
- > Inform the IRB once your research is complete so that the protocol may be inactivated.

Please contact your IRB Program Manager with any questions or if you are in need of assistance. Thank you for your diligence in the care of human subjects research participants.

Institutional Review Board for the Protection of Human Subjects | Office of Research Compliance | Montana State University

Access your protocol anytime at <https://montanaprod.topazti.net/Elements?emailLink=11%2c102%2c8247>.

APPENDIX B

SAMPLE HOMEWORK: TEXTBOOK READING GUIDE

Cellular Growth Reading Guide – Chapter Section 9.1, pg. 244-247**1. Cell Size Limitation**

Purpose: Read and answer the following to understand why cells are relatively small.

- A. As cell size increases, the surface area to volume ratio _____.
- B. Explain why a high ratio of surface area to volume benefits a cell.
- C. State the relationship between cell size and the transport of substances and cellular communication. *Is a bigger cell or a smaller cell optimal?*
- D. If a cube representing a cell is 4 cm on a side, calculate the surface area-to-volume ratio, and explain why this is or is not a good size for a cell. *Think back to our Cell Size and Diffusion Lab.*
SHOW YOUR WORK.

Check your understanding:

Which is a reason why cells remain small?

- a. Large cells have difficulty diffusing nutrients rapidly enough.
- b. The need for signaling limits cell size.
- c. Transportation of wastes becomes a problem for large cells.
- d. All of the above.

2. *The Cell Cycle*

Purpose: Read and answer the following to determine the primary stages of the cell cycle.

- a. Draw and label Figure 3 on page 246.
- b. List and describe the three stages of interphase.
- c. Describe what happens to DNA during the S stage of interphase.
- d. Differentiate between mitosis and cytokinesis.

Check your understanding:

Which describes the activities of the cell that include cellular growth and cell division?

- a. Chromatin
- b. Cytoplasm
- c. Mitosis
- d. Cell cycle

APPENDIX C

ANONYMOUS PRE-TREATMENT QUESTIONNAIRE

Participation in this research is voluntary and participation or non-participation will not affect a student's grades or class standing in any way.

For each statement, please indicate the response that best matches your experience in high school.

1. On average, how often do you complete your Biology homework?
Rarely Usually (*Once or Twice a Week*) Almost always (*Three times a week*)
2. If you do not complete the assignments nightly, what is your most common reason for not doing them?
3. Biology homework helps me better understand what we are learning.
Strongly Disagree Disagree Undecided Agree Strongly Agree
4. Why did you answer question 3 the way you did?
5. Please explain what it means to copy.
6. Have you ever copied an internet document for a classroom assignment?
Never Only Once Two or more times
7. Have you ever cheated during a test at school?
Never Only Once Two or more times
8. Have you ever copied another's homework?
Never Only Once Two or more times
9. Have you ever allowed another student to copy my homework?
Never Only Once Two or more times
10. Have you ever copied another's biology homework specifically?
Never Only Once Two or more times
11. Explain your rationale to questions 6-10 above.
12. If you were a teacher, would you give homework? Why or why not?
13. Please share additional thoughts or comments.
14. Current grade in Biology: _____ (approximately)

APPENDIX D

TEACHER TREATMENT JOURNAL

Unit # _____ Homework Name: _____ Date: _____

What would I do differently if I were teaching this again?

Observations of initial response (day 1) What worked and what didn't work?	
Supporting narrative comments: • • •	
Observations of response after completion (day 2) What worked, what didn't work?	
Supporting narrative comments: • • •	

APPENDIX E

TREATMENT HOMEWORK QUESTIONNAIRE

Participation in this research is voluntary and participation or non-participation will not affect a student's grades or class standing in any way.

DAILY FORMATIVE ASSESSMENT QUESTION

Homework Assignment Name: _____

Directions: For each statement, please indicate your motivation for completing the HW and whether you agree or disagree with the statement by circling the response that best matches your rating.

1. How correct do you think your answers are to the prompt above are?
 Not at all Mostly Incorrect Somewhat Correct Mostly Correct Extremely Correct
2. The daily prompts build my confidence in what we're learning.
 Strongly Disagree Disagree Undecided Agree Strongly Agree
3. I felt prepared to answer the prompt above.
 Strongly Disagree Disagree Undecided Agree Strongly Agree
4. Why did (or didn't) you feel prepared?
5. Did you complete the homework that was due today?
 Yes No Partially
6. What would you say is the major reason you did/did not complete the HW that was due today?
7. I completed this HW assignment because I want to understand the subject
 Strongly Disagree Disagree Undecided Agree Strongly Agree
8. I completed this HW assignment because that is the expectation.
 Strongly Disagree Disagree Undecided Agree Strongly Agree
9. I believe completing the HW will help me score better on the test.
 Strongly Disagree Disagree Undecided Agree Strongly Agree
10. Additional comments?

APPENDIX F

NON-TREATMENT HOMEWORK QUESTIONNAIRE

Participation in this research is voluntary and participation or non-participation will not affect a student's grades or class standing in any way.

DAILY FORMATIVE ASSESSMENT QUESTION

Homework Assignment Name: _____

Directions: For each statement, please indicate your motivation for completing the HW and whether you agree or disagree with the statement by circling the response that best matches your rating.

1. How correct do you think your answer is to the prompt above?
 Not at all Mostly Incorrect Somewhat Correct Mostly Correct Extremely Correct
2. The daily prompts build my confidence in what we're learning.
 Strongly Disagree Disagree Undecided Agree Strongly Agree
3. Did you complete the homework that was due today?
 Yes No Partially
4. What would you say is the major reason you did/did not complete the HW that was due today?
5. How correct do you think your answers are to the HW question are?
 Not at all Mostly Incorrect Somewhat Correct Mostly Correct Extremely Correct
6. I completed the HW to earn the points.
 Strongly Disagree Disagree Undecided Agree Strongly Agree
7. I completed this HW assignment because I want to understand the subject.
 Strongly Disagree Disagree Undecided Agree Strongly Agree
8. I completed this HW assignment because that is the expectation.
 Strongly Disagree Disagree Undecided Agree Strongly Agree
9. I believe completing the HW will help me score better on the test.
 Strongly Disagree Disagree Undecided Agree Strongly Agree
10. Additional comments?

APPENDIX G

UNIT ASSESSMENT QUESTIONNAIRE

Name:

Date:

Period:

Unit insert unit number and title here Assessment Questionnaire

Participation in this research is voluntary and participation or non-participation will not affect a student's grades or class standing in any way.

For each statement, please indicate the response that best matches your experience during this unit.

1. How correct do you think your answers on the unit test are?
 Not at all Mostly Incorrect Somewhat Correct Mostly Correct Extremely Correct
2. The daily prompts helped build my confidence in what we're learning.
 Strongly Disagree Disagree Undecided Agree Strongly Agree
3. I believe completing the HW helped me score better on the test.
 Strongly Disagree Disagree Undecided Agree Strongly Agree
4. The Biology homework helped me better understand what we are learning.
 Strongly Disagree Disagree Undecided Agree Strongly Agree
5. Do you think you could have learned this material as successfully if you had not been asked to complete homework assignments?
 Strongly Disagree Disagree Undecided Agree Strongly Agree
6. Why or why not?
7. Please describe any other class activities, moments, or assignments that you think played a role in you learning the material in this unit.
8. How did they better help you learn the concepts in this unit?
9. On average, how often did you complete your biology homework throughout this unit?
 Rarely Usually (*Once or Twice a Week*) Almost always (*Three times a week*)
10. If you **did not** complete the assignments nightly, what is your most common reason for not doing them?
11. If you **did** complete the assignments nightly, what is your most common reason for not doing them?
12. Additional comments?

APPENDIX H

FOCUS GROUP INTERVIEW QUESTIONS

Focus Group Interview Questions

READ - Please remember that participation in this research is voluntary. Participation or non-participation will not affect your grades or class standing in any way.

1. Why do you complete homework?

i. Probing –

1. Expectation? Earn points? better understand the content?

2. Do you have homework in other classes?

i. Do you complete that homework?

ii. What is your reason for completing that.

3. What was your experience with each policy (graded and ungraded biology homework)?

4. Which did you like better (graded or ungraded biology homework)? Why? Why did you/or didn't you do ungraded homework?

5. Did you feel confident prior to your most recent unit assessment? Why or why not? What strategies helped you feel prepared?

6. Do you think the number of times students copied homework changed during the study?
How so? Why?

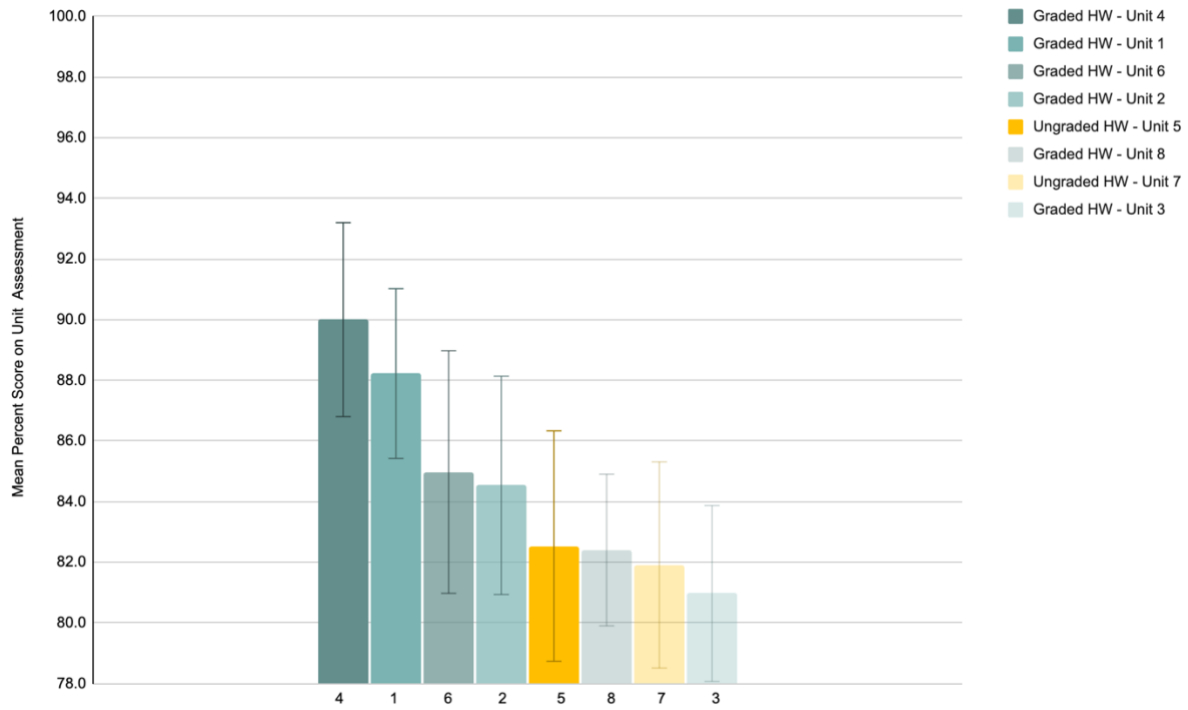
i. What could a teacher do to reduce copying?

7. Is there anything else you want me to know about biology class, assessments, or homework?

8. If you were a teacher, would you give homework? Why or why not?

APPENDIX I

MEAN UNIT ASSESSMENT SCORES



Mean percent score on unit assessment for students with graded homework and ungraded homework, error bars show two times the standard error, ($N=52$).